

Reply to Office Action dated June 17, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus for interworking between heterogeneous No. 7 signaling networks, comprising:

a plurality of signaling network processing units corresponding to heterogeneous No. 7 signaling networks, each configured to interwork with each other in a one-to-one manner, and each configured to execute a signaling network management function and a signaling message handling function for a corresponding signaling network; and

a cross-routing controlling unit coupled between the plurality of signaling network processing units and configured to store network management information of each signaling network transmitted from each of the plurality of signaling network processing units and configured to cross-route a signaling message between the plurality of signaling network processing units based on the stored network management information, wherein each of the plurality of signaling network processing units each comprises:

a signaling network management unit to perform network management for a corresponding signaling network and transmit a state of each signaling point corresponding to the signaling network to the cross-routing controlling unit; and

a signaling message handling unit to transmit the signaling message to be cross-routed from a corresponding current signaling network to the cross-routing controlling unit, and

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route the signaling message transmitted from the cross-routing controlling unit to a corresponding destination signaling network, and wherein the signaling message handling unit comprises:

a message discrimination unit to determine whether the destination signaling point of the signaling message is a current signaling point;

a message distribution unit to distribute the signaling message to a corresponding local message transfer part (MTP) user part in the current signaling point, if the destination signaling point of the signaling message is the current signaling point; and

a message routing unit to request that the signaling message be cross-routed to a heterogeneous signaling network, if the destination signaling point of the signaling message is not the current signaling point and does not exist in the corresponding current signaling network.

2-3. (Canceled)

4. (Currently Amended) The apparatus of claim [[3]] 1, wherein the message routing unit routes the signaling message to the corresponding signaling network if it receives the signaling message routed by the cross-routing unit, and if the destination signaling point of the received signaling message is contained in the corresponding signaling network and is accessible, and otherwise the message routing unit routes the signaling message to the corresponding destination signaling point.

5. (Original) The apparatus of claim 1, wherein the signaling network processing unit performs functions of a message transfer part (MTP) protocol, and the cross-routing controlling unit performs functions of a MTP user part protocol for the signaling network processing unit, among No. 7 protocols.

6. (Original) The apparatus of claim 1, wherein the cross-routing controlling unit routes the signaling message to the signaling network processing unit of a destination signaling network in accordance with the status information of the signaling point transmitted from each signaling network processing unit.

7-16. (Canceled)

17. (Currently Amended) A system for interworking heterogeneous No. 7 signaling networks, comprising:

first and second signal network processing units, each coupled to a corresponding heterogeneous No. 7 signaling network; and

a cross-routing control unit coupled to each of the signal networking processing units, wherein the cross-routing control unit stores network management information received from the first and second signal network processing units and performs cross-routing of a signaling message from the first signal network processing unit to the second signal network processing unit, wherein each of the first and second signal network processing units comprises:

a signaling network management unit to perform network management for a corresponding signaling network and transmit a state of each signaling point corresponding to the signaling network to the cross-routing controlling unit; and

a signaling message handling unit to transmit the signaling message to be cross-routed from a corresponding current signaling network to the cross-routing controlling unit, and route the signaling message transmitted from the cross-routing controlling unit to a corresponding destination signaling network, and wherein the signaling message handling unit comprises:

a message discrimination unit to determine whether the destination signaling point of the signaling message is a current signaling point;

a message distribution unit to distribute the signaling message to a corresponding local message transfer part (MTP) user part in the current signaling point, if the destination signaling point of the signaling message is the current signaling point; and

a message routing unit to request that the signaling message be cross-routed to a heterogeneous signaling network, if the destination signaling point of the signaling message is not the current signaling point and does not exist in the corresponding current signaling network.

18. (Original) The system of claim 17, wherein the cross-routing control unit receives a MTP-transfer primitive from the first signal network processing unit, which indicates that a signaling message needs to be transferred from the first signaling network to the second

signaling network, determines whether a signaling point of the second signaling point is accessible, and cross-routes the signaling message from the first signaling network to the second signaling network if the destination signaling point is accessible.

19. (Original) The system of claim 17, wherein the cross-routing control unit receives a first MTP primitive, which represents status information of a first signaling point of the first signal network, receives a second MTP primitive, which represents status information of a second signaling point of the second signaling network, determines a type the MTP primitive received from each of the first and second signaling points, and determines a status of each of the first and second singling points based on the type of MTP primitive received from the corresponding signaling point to manage the status of each of the signaling points.

20. (Original) The system of claim 17, wherein each of a first and second signaling point associated with the first and second network processing units, respectively, request cross-routing of a signaling message by determining if a destination signaling point exists in the requesting signaling network, determining whether cross-routing of the signaling message to the destination signaling network is possible, and transmitting the signaling message to the cross-routing control unit using a MTP-transfer indication primitive.

21-22. (Canceled)

23. (Currently Amended) The system of claim [[22]] 17, wherein the message routing unit routes the signaling message to the corresponding signaling network if it receives the signaling message routed by the cross-routing unit, and if the destination signaling point of the received signaling message is contained in the corresponding signaling network and is accessible, and otherwise the message routing unit routes the signaling message to the corresponding destination signaling point.

24-29. (Canceled)

30. (Currently Amended) A method of cross-routing a signaling message between signaling points in a heterogeneous No. 7 signaling-network networks, comprising:

receiving a MTP-transfer primitive from a first signaling point in a first signaling network indicating that a signaling message needs to be transferred from the first signaling point to a destination signaling point in a second signaling network;

determining whether the destination signaling point exists;

determining whether the destination signaling point is accessible if the destination signaling point exists; and

cross-routing the signaling message from the first signaling point to the destination signaling point if the destination signaling point is accessible.

31. (Original) The method of claim 30, wherein the signaling message is discarded and the transfer of the signaling message is prohibited if the destination signaling point does not exist or if the destination signaling point is not accessible.

32. (Original) The method of claim 30, further comprising receiving a MTP primitive representing status information of the first signaling point;

receiving a MTP primitive representing status information of the destination signaling point; and

determining an accessibility status of the first signaling point and the destination signaling point based on a type of the received MTP primitive received from the corresponding signaling point.